WHAT IS CLAIMED IS:

1. A method for servicing transit and transmit traffic in a node of a network, the network including a plurality of nodes connected by first and second rings formed by two or more transmission media, the method comprising:

receiving usage data from a downstream node;

identifying a first weighted value associated with a provisioning rate associated with the downstream node and a second weighted value associated with a provisioning rate of the node;

determining an allowed usage for the node using the usage data and the first and second weighted values; and

servicing transmit and transit traffic received at the node including limiting the servicing of the transmit traffic in accordance with the determined allowed usage.

2. The method of claim 1, further comprising

determining usage data for the node based on the usage data received from the downstream node; and

forwarding the usage data to an upstream node.

3. The method of claim 2, wherein the step of determining usage data includes

determining if the node is congested;

determine if the usage data received indicates that a downstream node is congested;

if both the node and the downstream node are congested, calculating the usage data to be the minimum of the prior actual usage data and the product of the ratio of the maximum provisioned usage rate factors for the node and the downstream node and the usage data received;

if the node is congested and the downstream node is not congested, maintaining the usage data for the node in an unchanged state; and

if the node is not congested,

determining if an actual weighted forward rate for the node is less than the received usage data,

if the actual weighted forward rate is less than the received usage data, setting the usage data for the node to indicate to an upstream node that the node is not congested, and

if the actual weighted forward rate is greater than or equal to the received usage data, setting the usage data for the node to be the received usage data.

4. The method of claim 1, wherein the step of determining the allowed usage for the node includes

determining if the node is congested;

determining if the usage data received indicates that a downstream node is congested;

if both the node and the downstream node are congested, calculating the allowed usage to be the product of the ratio of the maximum provisioned usage rate factors for the node and the downstream node and the usage data received;

if the node is congested and the downstream node is not congested, maintaining the allowed usage for the node in an unchanged state; and

if the node is not congested, setting the allowed usage to be the usage value received from the downstream node.

5. The method of claim 1, further comprising receiving the first weighted value along with the usage data from the downstream node.

6. The method of claim 5, further comprising receiving the first weighted value and the usage data as a scalar that describes a ratio between the two.

7. The method of claim 1, wherein the step of identifying the first and second weighted values includes retrieving the first and second weighted values from a table accessible by the node.

8. A method for servicing transit and transmit traffic in a node of a network, the network including a plurality of nodes connected by first and second rings formed by two or more transmission media, the method comprising:

receiving usage data and a desired forwarding rate from a downstream node;

identifying a first weighted value associated with a provisioning rate associated with the downstream node and a second weighted value associated with a provisioning rate of the node;

determining an allowed usage for the node using the usage data and the first and second weighted values;

determining an allowed forwarding rate for the node defining a rate at which the transit and transmit traffic combined is forwarded onto a ring using the received desired forwarding rate;

servicing transmit and transit traffic received at the node including limiting the servicing of the transmit traffic in accordance with the determined allowed usage and all traffic in accordance with the determined allowed forwarding rate.

9. The method of claim 8, further comprising

determining a desired forward rate for an upstream node based on the congestion state of the node and the usage data received from the downstream node; and

forwarding the desired forward rate to the upstream node.

10. The method of claim 9, wherein the step of determining the desired forward rate for a node includes

determining if the node is congested;

determining if the usage data received indicates that a downstream node is congested;

if both the node and the downstream node are congested, determining if a transmit queue is empty;

if the transmit queue is not empty, determining if the allowed rate for the node is greater than the actual usage plus a predetermined amount;

if the allowed rate is greater, calculating the desired forward rate to be a minimum of a suggested rate term and the upstream line rate where the suggested rate term is the sum of the desired forward rate received and a drop rate for the node minus a usage term where the usage term is a predetermined value;

if the transmit queue is empty or if the allowed rate is less, calculating the desired forward rate to be a minimum of two terms, where a first term is the sum of the desired forward rate received and the drop rate for the node minus the actual usage rate for the node

and where the second term is the sum of the minimum span line rate and the drop rate for the node minus the actual usage rate for the node;

if the node is congested and the downstream node is not congested, calculating the desired forward rate to be the sum of two terms, where the first term is the difference of the downstream line rate and the actual usage and the second term is the difference of the drop rate for the node and a predetermined amount; and

if the node is not congested, setting the desired forward rate to be equal to the upstream line rate.

11. The method of claim 10 where the predetermined value is a constant.

12. The method of claim 10 where the predetermined value is the difference of the allowed usage and the actual usage rate divided by two.

13. The method of claim 8, further comprising

determining usage data for the node based on the usage data received from the downstream node; and

forwarding the usage data to an upstream node.

14. The method of claim 13, wherein the step of determining usage data includes determining if the node is congested;

determine if the usage data received indicates that a downstream node is congested;

if both the node and the downstream node are congested, calculating the usage data to be the minimum of the prior actual usage data and the product of the ratio of the maximum provisioned usage rate factors for the node and the downstream node and the usage data received;

if the node is congested and the downstream node is not congested, maintaining the usage data for the node in an unchanged state; and

if the node is not congested,

determining if an actual weighted forward rate for the node is less than the received usage data,

if the actual weighted forward rate is less than the received usage data, setting the usage data for the node to indicate to an upstream node that the node is not congested, and

if the actual weighted forward rate is greater than or equal to the received usage data, setting the usage data for the node to be the received usage data.

15. The method of claim 8, wherein the step of determining the allowed forward rate for a node includes

determining if the node is congested;

determining if the usage data received indicates that a downstream node is congested;

if both the node and the downstream node are congested, determining if a transmit queue is empty;

if the transmit queue is not empty, determining if the allowed rate for the node is greater than the actual usage plus a predetermined amount;

if the allowed rate is greater, setting the nodes allowed forward rate to be the minimum of a suggested rate term and the downstream line rate where the suggested rate term is the sum of the desired forward rate received and the allowed usage minus the actual usage for the node;

if the transmit queue is empty or if the allowed rate is less, setting the allowed forward rate for the node to be the maximum of the desired forward rate received and the minimum span line rate;

if the node is congested and the downstream node is not, configuring the node to send at the full downstream rate including setting the allowed forward rate to be equal to the downstream line rate; and

if the node is not congested, setting the allowed line rate to the desired forward rate received.

16. The method of claim 8, wherein the step of determining the allowed usage for the node includes

determining if the node is congested;

determining if the usage data received indicates that a downstream node is congested;

if both the node and the downstream node are congested, calculating the allowed usage to be the product of the ratio of the maximum provisioned usage rate factors for the node and the downstream node and the usage data received;

if the node is congested and the downstream node is not congested, maintaining the allowed usage for the node in an unchanged state; and

if the node is not congested, setting the allowed usage to be the usage value received from the downstream node.

17. The method of claim 8, further comprising receiving the first weighted value along with the usage data from the downstream node.

18. The method of claim 17, further comprising receiving the first weighted value and the usage data as a scalar that describes a ratio between the two.

19. The method of claim 8, wherein the step of identifying the first and second weighted values includes retrieving the first and second weighted values from a table accessible by the node.

20. A node in a network including a plurality of nodes connected by first and second rings formed by two or more transmission media, the node comprising:

fairness logic configured to

receive usage data from a downstream node;

identify a first weighted value associated with a provisioning rate associated with the downstream node and a second weighted value associated with a provisioning rate of the node;

determine an allowed usage for the node using the usage data and the first and second weighted values; and

service transmit and transit traffic received at the node including limiting the servicing of the transmit traffic in accordance with the determined allowed usage.

21. A node in a network including a plurality of nodes connected by first and second rings formed by two or more transmission media, the node comprising:

fairness logic configured to

receive a desired forwarding rate from a downstream node;

determine an allowed forwarding rate for the node defining a rate at which the transit and transmit traffic combined is forwarded onto a ring using the received desired forwarding rate; and

service transmit and transit traffic received at the node including limiting all traffic in accordance with the determined allowed forwarding rate.

22. A node in a network including a plurality of nodes connected by first and second rings formed by two or more transmission media, the node having an associated host, the host including a transmit buffer for storing host traffic that is to be added to a ring coupled to the node, the node comprising:

a transit buffer having an associated first and a second lesser threshold value;

fairness logic for mediating between traffic associated with the transit buffer and host traffic in the transmit buffer, the fairness logic configured to

service the transmit and the transit buffers in a round robin fashion if the amount of traffic in the transit buffer exceeds the second threshold.

23. The node of claim 22, wherein the fairness logic configured to service the transit buffer if the amount of traffic in the transit buffer exceeds the first threshold.

24. The node of claim 22, wherein the fairness logic configured to service the transmit buffer if the amount of traffic in the transit buffer is less than the second threshold.

25. A node in a network including a plurality of nodes connected by first and second rings formed by two or more transmission media, the node having an associated host, the host including a transmit buffer for storing host traffic that is to be added to a ring coupled to the node, the node comprising:

a transit buffer having an associated high priority queue and a plurality of low priority queues;

a low priority queue counter operable to maintain a count of all traffic in any of the plurality of low priority queues;

fairness logic for mediating between traffic associated with the transit buffer and host traffic in the transmit buffer, the fairness logic configured to

service one or more of the low priority transit queues if the count exceeds a first threshold.

26. The node of claim 25, wherein the fairness logic is configured to service the low priority queues in accordance with a strict priority.

27. The node of claim 25, wherein the fairness logic is configured to service the low priority queues in weighted round robin fashion.

28. The node of claim 25, wherein the fairness logic configured to service the transmit buffer if the amount of traffic in the transit buffer is less than the first threshold.